CLAIMS

1. An audio user-interfacing method in which items are represented in an audio field by respective synthesized sound sources from where sounds related to the item appear to emanate, the method comprising the steps of:

(a) generating an audio field in which said sound sources are synthesized at respective rendering positions to provide sounds related to the items concerned;

(b) determining the relative location of a particular said sound source in the audio field with respect to a predetermined reference;

(c) providing an audio indication of said relative location of said particular sound source, as determined in step (b), as a said sound emanating from that sound source.

2. A method according to claim 1, wherein steps (b) and (c) are effected for multiple said sound sources, each of which constitutes a respective said particular sound source for these steps.

3. A method according to claim 1, wherein the indicator reference is one of:

- the presentation reference;
- a current facing direction of the user;
- a straight-ahead facing direction of the user;
- a world-fixed direction.

4. A method according to claim 1, wherein the said relative location of the said particular sound source dynamically varies as a result of variation of at least one of the predetermined reference and the rendering position of the sound source, step (c) dynamically changing said audio indication accordingly.

5. A method according to claim 4, including varying the rendering position of the said particular sound source by varying an offset between an audio-field reference relative to which the sounds sources are positioned in the audio field, and a presentation reference

determined by a mounting configuration of audio output devices through which the sound sources are synthesised.

6. A method according to claim 5, wherein said offset is varied to stabilise audio field relative to one of:

- a user's head;
- a user's body;
- a vehicle in which the user is travelling;
- the world;

this stabilisation taking account of whether the audio output devices are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body, or turning of the vehicle.

7. A method according to claim 5, wherein said offset is varied in response to user input via an input device.

8. A method according to claim 1, wherein the said relative position of the said particular sound source has at least two degrees of freedom.

9. A method according to claim 8, wherein step (b) is restricted to determining said relative location in one of said degrees of freedom, the audio indication in step (c) being similarly restricted.

10. A method according to claim 1, wherein at least some of the said items represented by the sound sources are audio labels for services, the method further involving selecting a service by selecting the corresponding audio-label sound source.

11. Apparatus for providing an audio user interface in which each of a plurality of items is represented in an audio field by at least one respective synthesized sound source from where sounds related to the item appear to emanate, the apparatus comprising:

- a generation subsystem for generating, through audio output devices, an audio field in which said sound sources are synthesized at respective rendering positions to

provide sounds related to the items concerned;

- relative-location determining means for determining the relative location of a particular said sound source in the audio field with respect to a predetermined reference; and
- audio-indication means operatively associated with the generation subsystem for providing an audio indication of said relative location of said particular sound source, as determined by the relative-location determining means, as a said sound emanating from that sound source.

12. Apparatus according to claim 11, wherein the relative-location determining means and the audio-indication means are operative to handle multiple said sound sources each as a said particular sound source.

13. Apparatus according to claim 11, wherein the indicator reference is one of:

- the presentation reference;
- a current facing direction of the user;
- a straight-ahead facing direction of the user;
- a world-fixed direction.

14. Apparatus according to claim 11, wherein the generation subsystem is such that at least one of the predetermined reference and the rendering position of the sound source can be dynamically varied whereby to vary said relative location of the said particular sound source ; the audio-indication means being operative to dynamically change said audio indication to match the current said relative location of the said particular sound source

15. Apparatus according to claim 14, wherein the generation sub-system comprises rendering-position determining means for determining the rendering position of each sound source, and rendering means, including said audio output devices, for rendering the sound sources at their respective rendering locations in the audio field; the rendering-position determining means comprising:

- means for setting the location of each said sound source relative to an audio-field reference;

- offset means for controlling an offset between the audio-field reference and a presentation reference determined by a mounting configuration of the audio output devices; and
- means for deriving the rendering position of each sound source based on the location of the sound source in the audio field and said offset.

16. Apparatus according to claim 15, wherein the offset means comprises stabilisation means for varying the said offset such as to stabilise the audio field reference relative to one of:

- a user's head;
- a user's body;
- a vehicle mounting the apparatus;
- the world;

this stabilisation taking account of whether the audio output devices are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body, or turning of the vehicle.

17. Apparatus according to claim 15, wherein said offset means comprises user input means for varying said offset.

18. Apparatus according to claim 11, wherein the said relative position of the said particular sound source has at least two degrees of freedom.

19. Apparatus according to claim 18, wherein said relative-location determining means step is operative to determine said relative location only in respect of one of said degrees of freedom.

20. Apparatus according to claim 11, wherein at least some of the said items represented by the sound sources are audio labels for services, the apparatus including a selection arrangement for selecting a service by selecting the corresponding audio-label sound source.

21. Apparatus for providing an audio user interface in which each of a plurality of items is represented in an audio field by at least one respective synthesized sound source from where sounds related to the item appear to emanate, the apparatus comprising:

- a generation subsystem operative to generate, through audio output devices, an audio field in which said sound sources are synthesized at respective rendering positions to provide sounds related to the items concerned;
- a relative-location determining arrangement operative to determine the relative location of a particular said sound source in the audio field with respect to a predetermined reference; and
- an audio-indication arrangement operatively associated with the generation subsystem for providing an audio indication of said relative location of said particular sound source, as determined by the relative-location determining arrangement, as a said sound emanating from that sound source.

22. Apparatus according to claim 21, wherein the relative-location determining arrangement and the audio-indication arrangement are operative to handle multiple said sound sources each as a said particular sound source.

23. Apparatus according to claim 21, wherein the indicator reference is one of:

- the presentation reference;
- a current facing direction of the user;
- a straight-ahead facing direction of the user;
- a world-fixed direction.

24. Apparatus according to claim 21, wherein the generation subsystem is such that at least one of the predetermined reference and the rendering position of the sound source can be dynamically varied whereby to vary said relative location of the said particular sound source; the audio-indication arrangement being operative to dynamically change said audio indication to match the current said relative location of the said particular sound source

25. Apparatus according to claim 24, wherein the generation sub-system comprises a rendering-position determining arrangement for determining the rendering position of each

sound source, and a rendering arrangement, including said audio output devices, operative to render the sound sources at their respective rendering locations in the audio field; the rendering-position determining arrangement comprising:

- a setting arrangement for setting the location of each said sound source relative to an audio-field reference;
- a control arrangement for controlling an offset between the audio-field reference and a presentation reference determined by a mounting configuration of the audio output devices; and
- a deriving arrangement operative to derive the rendering position of each sound source based on the location of the sound source in the audio field and said offset.

26. Apparatus according to claim 25, wherein the control arrangement comprises a stabilisation arrangement for varying the said offset such as to stabilise the audio field reference relative to one of:

- a user's head;
- a user's body;
- a vehicle mounting the apparatus;
- the world;

this stabilisation taking account of whether the audio output devices are world, vehicle, body or head mounted, and, as appropriate, rotation of the user's head or body, or turning of the vehicle.

27. Apparatus according to claim 25, wherein the control arrangement comprises user input functionality for varying said offset.

28. Apparatus according to claim 21, wherein the said relative position of the said particular sound source has at least two degrees of freedom.

29. Apparatus according to claim 28, wherein said relative-location determining arrangement step is operative to determine said relative location only in respect of one of said degrees of freedom.

30. Apparatus according to claim 21, wherein at least some of the said items represented by the sound sources are audio labels for services, the apparatus including a selection arrangement for selecting a service by selecting the corresponding audio-label sound source.